

Application No.: 10/550,672
Filing Date: July 31, 2006

AMENDMENTS TO THE DRAWINGS

Please add Figure 2 of the attached New Sheet after Figure 1 of Sheet 1. Figure 2 depicts an embodiment that includes a proportional pressure regulator 11. Support for new Figure 2 can be found on at least page 2, lines 7-22 and page 4, lines 6-16, as well as in original Claims 1 and 9 of Applicant's specification. The amendments to the drawings introduce no new matter.

REMARKS

Claims 1-10 stand rejected. Claims 1, 3-7, and 9 have been amended, Claim 8 has been cancelled, and Claims 11-19 are new. Support for the amendments can be found in at least Figure 1, original Claims 1-10, and paragraphs 1-11 of the original specification. The amendments add no new matter. Thus, Claims 1-7 and 9-19 are presented for consideration and further examination in light of the following remarks.

Objections to Drawings

The Examiner objected to the drawings under 37 C.F.R. § 1.83(a) for failing to show every feature of the invention specified in the claims.

Regarding the Examiner's assertion that the drawings fail to show a "pneumatic cylinder" as recited in Claim 1, Applicant respectfully directs the Examiner's attention to Figure 1 reference number 10 which identifies a "pneumatic cylinder." (See page 3, lines 23-27 of Applicant's specification.)

Regarding the Examiner's objection that the drawings fail to show a "proportional pressure regulator," Applicant has added new Figure 2 which illustrates a dental furnace comprising a proportional pressure regulator 11. Support for new Figure 2 can be found on at least page 2, lines 7-22 and page 4, lines 6-16, as well as in Claims 1 and 9 of Applicant's specification. The amendments to the drawings introduce no new matter.

Regarding the Examiner's assertion that the drawings fail to show an "electronic control unit," Applicant notes that Figure 1 reference numbers 2a and 2b identify a "pneumatic/electronic control section... constructed in two compartments." (Page 3, lines 11-12.) New Figure 2 also includes a "pneumatic/electronic control section" identified by reference numbers 2a and 2b.

Regarding the Examiner's objection that the drawings fail to show "pressure sensors" as recited in Claim 8, Applicant has cancelled Claim 8.

In light of the above discussed amendments to the drawings and the claims, Applicant respectfully submits that the objections to the drawings have been overcome.

Claim Rejections Under 35 U.S.C. § 112, First Paragraph

The Examiner rejected Claims 2 and 4 under 35 U.S.C. § 112, first paragraph, asserting that the specification, “while being enabling for the means of a pressure reducer being either the two pressure reducers or a proportional pressure regulator, does not reasonably provide enablement for the combination of such pressures and the regulator.” Although Applicant may not agree with the substance of this rejection, Applicant has amended Claim 1 to eliminate reference to a “proportional pressure regulator,” such that Claim 1 now recites “a hood-shaped firing chamber into which a muffle can be inserted and which is closed in operation by a bottom plate; a pneumatic cylinder mounted on the firing chamber; and at least two pressure reducers configured to set a working pressure of the pneumatic cylinder, each pressure reducer being provided with a different working pressure.” Because Claim 1, from which Claims 2 and 4 depend, no longer recites a “proportional pressure regulator,” Applicant respectfully requests that the Examiner withdraw the rejection of Claims 2 and 4.

Claim Rejections Under 35 U.S.C. § 112, Second Paragraph

The Examiner rejected Claims 1-10 under 35 U.S.C. § 112, second paragraph, as being indefinite. In particular, the Examiner rejected Claim 1 for use of the word “can” in the phrase “whose working pressure can be set by means of a pressure reducer,” Claims 2 and 4 for failing to clearly recite the interaction between the pressure reducers and the proportional pressure regulator, and Claims 6 and 7 as lacking proper antecedent basis for “the guide column.”

In response, Applicant has amended Claim 1 to delete the phrase “whose working pressure can be set by means of a pressure reducer,” and to recite instead “at least two pressure reducers configured to set a working pressure of the pneumatic cylinder.” Accordingly, Applicant respectfully requests that the Examiner withdraw this rejection of Claim 1.

Applicant has also amended Claim 1, from which Claims 2 and 4 depend, to eliminate the phrase “or the pressure reducer is provided in the form of a proportional pressure regulator with electronically controllable different working pressures.” Applicant therefore respectfully requests that the Examiner withdraw this rejection of Claims 2 and 4.

Applicant has also amended Claims 6 and 7, which previously depended from Claim 1, to now depend on Claim 3, which recites “a guide column.” Applicant respectfully submits that this amendment cures the lack of antecedent basis in Claims 6 and 7.

Claim Rejections Under 35 U.S.C. § 102(b)

The Examiner rejected Claims 1 and 7 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 3,860,738 ("Hintenberger"). A claim can only be anticipated under 35 U.S.C. § 102(b) when each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *See* M.P.E.P. § 2131. Applicant respectfully submits that Hintenberger fails to disclose each and every feature of the claims.

Claim 1 is directed to a dental furnace for producing compacted ceramics and recites, among other features, "at least two pressure reducers configured to set a working pressure of the pneumatic cylinder, each pressure reducer being provided with a different working pressure." The Examiner asserts that Hintenberger discloses "at least two pressure reducers configured to set a working pressure of the pneumatic cylinder, each pressure reducer being provided with a different working pressure" in parts numbered 14, 16, 17, 18, and 19 of Hintenberger Figure 1. Hintenberger, however, discloses that parts 16, 17, and 19 are solenoid valves whose operation controls the flow of gas to a firing chamber 24 inside a firing oven. (See Hintenberger, Column 3, Lines 10-12 and Column 3, Lines 42-49, and Figure 1.) The firing chamber 24 and the firing oven are not components of a pneumatic cylinder, nor are they connected to the operation of a pneumatic cylinder. Accordingly, parts 16, 17, and 19 do not "set a working pressure of the pneumatic cylinder" as recited in Claim 1.

Further, parts 14 and 18 of Hintenberger are in fact throttle valves that function in tandem to control the amount of fluid supplied to the pneumatic cylinder. (See Hintenberger Column 3, Lines 53-54.) Hintenberger does not indicate that the valves 14 and 18 serve to "set a working pressure of the pneumatic cylinder," or that the valves 14 and 18 are each "provided with a different working pressure." Moreover, Hintenberger specifically states that "[c]heck valve 15 in conduit 1b *maintains the fluid pressure* in the cylinder 2 during this stage" (Hintenberger Column 3, Lines 59-63, emphasis added). Thus, Hintenberger only discloses maintaining a single operating pressure. Accordingly, Applicant respectfully submits that Hintenberger fails to disclose "at least two pressure reducers configured to set a working pressure of the pneumatic cylinder, each pressure reducer being provided with a different working pressure," as recited in Claim 1.

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Because Hintenberger fails to disclose each and every element of Claim 1, Applicant respectfully submits that Hintenberger fails to anticipate Claim 1. Accordingly, Applicant respectfully requests that the Examiner withdraw the rejection of Claim 1.

Claim Rejections Under 35 U.S.C. § 103(a)

The Examiner rejects Claims 1-10 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,252,202 ("Zyckek") in view of U.S. Patent No. 6,105,483 ("Takeda") or alternatively in view of U.S. Patent No. 6,851,529 ("Jones"). To establish a *prima facie* case of obviousness, the Examiner must establish that the prior art reference (or references when combined) render all of the claim limitations obvious: "All words in a claim must be considered in judging the patentability of that claim against the prior art." (*In re Wilson*, 424 F.2d 1382, 165 U.S.P.Q. 494, 496 (CCPA 1970); *see also M.P.E.P. § 2143.03.*) Further, the Examiner must clearly articulate reasons why the claimed invention would have been obvious, with some rational underpinning to support the legal conclusion of obviousness, and taking into consideration how a person of ordinary skill would have understood the prior art teachings. (M.P.E.P. §2141). The art must be such that the skilled artisan would have a reasonable expectation of success at practicing the claimed invention. (M.P.E.P. §2143.02). Applicant respectfully submits that a *prima facie* case of obviousness is not supported by the references cited by the Examiner.

Zyckek is directed to a furnace for heat treatment of dental materials. More particularly, Zyckek focuses on the use of both upper and lower heating elements to minimize problems associated with temperature variation inside the furnace. Zyckek only briefly mentions the existence of a piston 48 and does not discuss working pressure at all. As acknowledged by the Examiner, Zyckek does not disclose "at least two pressure reducers configured to set a working pressure of the pneumatic cylinder, each pressure reducer being provided with a different working pressure."

In the Office Action, the Examiner cites Takeda and Jones as references that supply this missing feature. The motivation cited by the Examiner for combining Takeda or Jones with Zyckek is a desire to "effectively process a muffle." Takeda and Jones and their combination with Zyckek are discussed below. Applicant initially notes, however, that the claimed dental furnace provides an advantage that is neither present nor appreciated in any cited reference. As

explained in the specification, compacted ceramics are created by introducing a muffle into a firing chamber and pressing a ceramic mass into the muffle with a pneumatic cylinder. (See Applicant's Specification, Page 1, Lines 8-12.) As discussed in Applicant's specification, the success of the creation of compacted ceramics requires adequate heating and pressure. However, as muffle sizes vary, the ability of the muffle to withstand pressure also varies. (See Specification, Page 1, Lines 22-31.) These variations in muffle strength lead to the possibility of a muffle failure. (See, Specification, Page 1, Lines 29-31.) Applicant has found that the likelihood of muffle failure can be reduced by the use of "at least two pressure reducers configured to set a working pressure of the pneumatic cylinder, each pressure reducer being provided with a different working pressure." Such an improvement is unappreciated in Zychek, which, as discussed above, focuses on the use of an upper and lower heating unit to minimize problems associated with temperature variation inside a furnace.

Applicant respectfully submits that Takeda cannot be properly combined with Zychek to render the features of Claim 1 obvious, as one of skill in the art would not have been motivated to combine Zychek and Takeda. Takeda, in contrast to Zychek, is directed to a cutting apparatus equipped with a tool that is pressed against a working surface. Takeda discloses that, over time, the combination of tool wear and constant cylinder air pressure results in an undesirable decrease in the depth of the cut. (See Takeda, Column 2, Lines 20-38.) Takeda reports one solution to this problem that uses multiple pressure reducers to set incrementally increasing cylinder pressures over the life of the tool. Takeda reports another solution in the form of automatically increasing the cylinder pressure as a function of total length cut. (See Takeda, Column 2, Line 66 to Column 3, Line 15 and Column 3, Lines 35-38.) Applicant respectfully submits that the tool wear and depth-of-cut considerations in Takeda are irrelevant to "effectively process[ing] a muffle" in a dental furnace such as that disclosed in Zychek. Thus, Applicant respectfully submits that one of skill in the art attempting to "effectively process a muffle" in a dental furnace would not have looked to a reference such as Takeda, which teaches methods of improving performance of a cutting tool apparatus as the cutting tool experiences wear, for a solution. Accordingly, Applicant respectfully submits that the Examiner's cited motivation of "effectively process[ing] a muffle" would not have led a person of skill in the art to combine modify Zychek with the features disclosed in Takeda.

Further, as mentioned above, the solutions presented in Takeda both comprise repeatedly (continuously or incrementally) increasing air pressure in a cylinder to increase the pressure between a cutting tool and a cutting surface over the life of the tool. (See Takeda, Column 2, Lines 56-65, Column 8, Lines 26-38, and Figures 4 and 9.) Applicant respectfully submits that one of skill in the art would not have modified Zychek in this manner, as a continued increase in pressure on the muffle would be expected to increase muffle fractures. Thus, Applicant respectfully submits that the “proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose,” and “there is no suggestion or motivation to make the proposed modification.” (See MPEP 2143.01(V), citing *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).)

With respect to Jones, this reference is directed to a multifunction vibration isolation strut with two modes of operation. In the first mode, a load is rigidly attached to the ground via a load path through a hydraulic damping element. In the second mode, the load is isolated from ground vibrations by an air suspension spring. (Jones, Column 1, Line 62 to Column 2, Line 10.) Thus, Jones is concerned with rigidly supporting a load while simultaneously isolating that load from possible vibrations. Applicant respectfully submits that the load support and vibration isolation considerations in Jones are irrelevant to “effectively process[ing] a muffle” in a dental furnace such as that disclosed in Zychek. Thus, Applicant respectfully submits that one of skill in the art attempting to “effectively process a muffle” in a dental furnace would not have looked to a reference such as Jones for a solution. Accordingly, Applicant respectfully submits that the Examiner’s cited motivation of “effectively process[ing] a muffle” would not have led a person of skill in the art to combine modify Zychek with the features disclosed in Jones.

For at least the above reasons, Applicant respectfully submits that one of skill in the art would not have combined Zychek with Takeda or Jones in the manner suggested by the Examiner, and thus, that the subject matter of Claim 1 is not rendered obvious under 35 U.S.C. § 103(a).

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Dependent Claims

Claims 2-7 and 9 depend directly or indirectly from Claim 1 and are therefore patentable for at least the same reasons that Claim 1 is patentable over the applied art. Therefore, allowance of Claims 2-7 and 9 is respectfully requested.

New Claims 11-19

New Claim 11 has been added which recites “a dental furnace for producing compacted ceramics, comprising: a hood-shaped firing chamber into which a muffle can be inserted and which is closed in operation by a bottom plate; a pneumatic cylinder mounted on the firing chamber; and a proportional pressure regulator configured to set a working pressure of the pneumatic cylinder, the proportional pressure regulator having electronically controllable different working pressures.” As discussed above in connection with Claim 1, Hintenberger only discloses maintaining a single operating pressure. Accordingly, Applicant respectfully submits that Hintenberger fails to disclose a “proportional pressure regulator having electronically controllable different working pressures” as recited in Claim 11. For similar reasons as those discussed above in connection with Claim 1, Applicant respectfully submits that Claim 11 is patentable over the applied art of record. Consideration and allowance of new Claim 11 is therefore respectfully requested.

Applicant has also added new Claims 12-19 which depend from new Claim 11. New Claim 12 recites “wherein the proportional pressure regulator is arranged on a plate-like support basis.” New Claim 13 recites “wherein an electronic control unit is provided on the support basis whose lines and/or cabling is introduced from below into the at least one duct in a guide column.” New Claim 14 recites “wherein the proportional pressure regulator has working pressures of 4, 5 and 6 bar.” New Claim 15 recites “wherein the input or system pressure in the pneumatic line is approximately 10 bar.” New Claim 16 recites “wherein the guide column comprises at least two ducts, with lines to the pneumatic cylinder and electric cables being guided separated from another.” New Claim 17 recites “wherein the firing chamber is suspended at the upper end of the guide column.” New Claim 18 recites “wherein the proportional pressure regulator is coupled with a program unit in which different heating and/or compacting processes are stored.” New Claim 19 recites “wherein outlet slots for lines or cables are provided in the

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upper/lower region of a duct.” Claims 12-19 depend directly or indirectly from Claim 11 and are therefore patentable for at least the same reasons that Claim 11 is patentable over the applied art. Consideration and allowance of new Claims 12-19 is therefore respectfully requested.

No Disclaimers or Disavowals

Although the present communication may include alterations to the application or claims, or characterizations of claim scope or referenced art, Applicant is not conceding in this application that previously pending claims are not patentable over the cited references. Rather, any alterations or characterizations are being made to facilitate expeditious prosecution of this application. Applicant reserves the right to pursue at a later date any previously pending or other broader or narrower claims that capture any subject matter supported by the present disclosure, including subject matter found to be specifically disclaimed herein or by any prior prosecution. Accordingly, reviewers of this or any parent, child or related prosecution history shall not reasonably infer that Applicant has made any disclaimers or disavowals of any subject matter supported by the present application.

CONCLUSION

The undersigned has made a good faith effort to respond to all of the noted rejections and to place the claims in condition for immediate allowance. Nevertheless, if any undeveloped issues remain or if an issue requires clarification, the Examiner is respectfully requested to call Applicant’s attorney in order to resolve any such issue promptly.

Applicant respectfully traverses each of the Examiner’s rejections and each of the Examiner’s assertions regarding what the prior art discloses or teaches, even if not expressly discussed herein. Although changes to the claims have been made, no acquiescence or estoppel is or should be implied thereby; such amendments are made only to expedite prosecution of the present application and are without prejudice to the presentation or assertion, in the future, of claims relating to the same or similar subject matter.

Any remarks in support of patentability of one claim should not be imputed to any other claim in this or a related application, even if similar terminology is used. Any remarks referring to only a portion of a claim should not be understood to base patentability on solely that portion;

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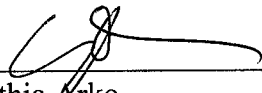
rather, patentability must rest on each claim taken as a whole. Applicant has not presented all arguments concerning whether the applied references can be properly combined in view of the clearly missing elements noted above, and Applicant reserves the right to later contest whether a proper reason exists to combine these references.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

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Dated: 05.24.2010

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